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TITLE:

Radiation, Scattering, and Guidance of Electromagnetic Fields by Arbitrarily Shaped Structures Embedded in Layered Dielectric Media

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QUARTERLY PROGRESS REPORT

(July 1, 1991 — September 30, 1991)

We continued work on the problem of an arbitrarily shaped microstrip patch antenna excited by a waveguide mode through an aperture of arbitrary shape. An efficient approach to the computation of the waveguide Green's functions, based on a Floquet expansion combined with Poisson acceleration, has been implemented in a computer program and tested. We also continued the study of three-dimensional microstrip discontinuities. As an initial part of this effort, we have implemented an efficient method of computing the spectral domain Green's functions for a layered uniaxial medium. This method is now being applied in the analysis of coplanar waveguide discontinuities. We began work on the problem of single and coupled integrated dielectric waveguides. An approach is being implemented, which combines an integral equation (exterior to the waveguide proper) and finite element (inside the inhomogeneous waveguide) methods.

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